

REMARKS

The present Amendment amends claims 1, 5, 7, and 10, leaves claims 6-9 unchanged, and adds claims 11-21. Therefore, the present application has pending claims 1 and 5-21.

35 U.S.C. §112 Rejections

Claim 7 stands rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicants regard as the invention. Amendments were made to claim 7 to bring it into conformity with the requirements of 35 U.S.C. §112, second paragraph. Therefore, reconsideration and withdrawal of the rejection of claim 7 under 35 U.S.C. §112, second paragraph are respectfully requested.

35 U.S.C. §103 Rejections

Claims 1 and 5-10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,719,200 to Wiebe in view of U.S. Patent No. 5,040,224 to Hara, further in view of Japanese Patent Application Publication No. 06-301768 to Iwata. This rejection is traversed for the following reasons. Applicants submit that the features of the present invention, as now more clearly recited in claims 1 and 5-10, are not taught or suggested by Wiebe, Hara or Iwata, whether taken individually or in combination with each other, as suggested by the Examiner. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw this rejection.

Amendments were made to the claims to more clearly describe features of the present invention. Specifically, the claims were amended to more clearly describe that the present invention is directed to an authentication system and a mobile storage device for authentication as recited, for example, in independent claims 1 and 10.

The present invention, as recited in claim 1 and as similarly recited in claim 10, provides an authentication system and a mobile storage device for authentication. The authentication system of claim 1 includes a mobile storage device and a reader/writer for performing at least one of reading information from and writing information into the mobile storage device. The reader/writer includes a biological information input device that inputs fingerprint information, a transmitting means for transmitting the core position generated in the preprocessing means to the mobile storage device according to a request from the mobile storage device according to a request from the mobile storage device. The preprocessing means calculates coordinates and curvatures for a plurality of candidate points of the fingerprint information input by the biological information input device, calculates an average value of the coordinates for the plurality of candidate points, and determines a cores position by the average value of the coordinates for the plurality of candidate points. The mobile storage device includes a template that registers a plurality of coordinates of featuring points of the fingerprint and partial images in a vicinity of the coordinates, a private key to be used for electronic authentication, a calculation means for calculating information for correcting a positional displacement, a

requesting means for calculating coordinates of featuring points of the input fingerprint, a judging means for determining whether the fingerprint registered in the template and the input fingerprint are identical, and means for making the private key available when the fingerprints are identical. The transmitting means of the reader/writer includes, for each partial image, means for extracting from the input fingerprint the partial images requested by the requesting means of the mobile storage device and means for repeatedly transmitting the extracted partial images to the mobile storage device, and means for repeatedly extracting and transmitting each of the partial images one by one until a satisfactory level of matching is achieved. The judging means of the mobile storage device includes means for repeating the matching result for each partial image. The prior art does not disclose all these features.

The above described features of the present invention, as now more clearly recited in the claims, are not taught or suggested by any of the references of record. More specifically, the features are not taught or suggested by Wiebe, Hara or Iwata, whether taken individually or in combination with each other.

Wiebe discloses a system for checking the right of access to sensitive information. However, there is no teaching or suggestion in Wiebe of the authentication system or a mobile storage device for authentication, as recited in independent claim 1, and as similarly recited in independent claim 10.

The Wiebe system checks access rights to sensitive information. The checking is based on current biometric data of a person whose right to access the

sensitive information is to be checked. The system includes a data carrier and a processing unit. The data carrier includes a memory containing sensitive information, a signal processing means and a communication means. The processing unit is adapted to receive the current biometric data from the person and includes a memory, a signal processing means and a communication means. The processing unit preprocesses the current biometric data and transfers the same to the processor of the data carrier via the communication means. The data carrier compares the received preprocessed biometric data with biometric reference data stored in advance in the memory of the data carrier to determine whether the right to access to the sensitive information exists.

One feature of the present invention, as recited in claim 1 and as similarly recited in claim 10, provides where the transmitting means of the reader/writer includes, for each partial image, means for extracting from the input fingerprint a partial image requested by the requesting means of the mobile storage device, means for transmitting the extracted partial image to the mobile storage device, and means for repeatedly extracting and transmitting each of the partial images one by one until a satisfactory level of matching is achieved. Wiebe does not disclose these features. As described in column 9, lines 46-49, Wiebe discloses where a preprocessed fingerprint image is transferred to a smart card 1, via communication circuits 3 and 3, where it is matched with a template. In this way, the preprocessed fingerprint image is transmitted all at once, and the preprocessed fingerprint image and the template are matched by comparing partial areas. On the other hand, in the

present invention, the fingerprint image is not transmitted all at once. Instead, to reduce the amount of memory required, partial images are extracted and transmitted individually, that is, one partial image is extracted and then transmitted at a time. As such, the features of the present invention are quite different from Wiebe.

Therefore, Wiebe fails to teach or suggest “wherein the transmitting means of the reader/writer comprises, for each partial image: means for extracting from the input fingerprint a partial image requested by the requesting means of the mobile storage device, means for transmitting the extracted partial image to the mobile storage device, and means for repeatedly extracting and transmitting each of the partial images one by one until a satisfactory level of matching is achieved” as recited in claim 1, and as similarly recited in claim 10.

The above cited deficiencies of Wiebe are not supplied by any of the other references, particularly Hara. Therefore, combining teachings of Hara with Wiebe still fails to teach or suggest the features of the present invention as now more clearly recited in the claims.

Hara teaches a fingerprint processing system capable of detecting a core of a fingerprint image by statistically processing parameters. However, there is no teaching or suggestion in Hara of the authentication system or a mobile storage device for authentication, as recited in independent claim 1, and as similarly recited in independent claim 10.

The Hara system detects a core position of a fingerprint image quantized into a plurality of picture elements. Statistical processing is carried out in relation to

parameters which are variable in dependency upon the core position and directions and curvatures of the picture elements preliminarily detected to specify ridges of the fingerprint image. The parameters may be existence probabilities of the core position that are determined for the directions and the curvatures. Such existence probabilities are successively calculated at each picture element and adjacent picture elements to be summed up and to detect a maximum one of the existence probabilities. A position that has the maximum existence probability is judged as the core position. Alternatively, the parameters may be differences between practical curvatures extracted from the fingerprint image and reference curvatures defining a reference curve. A minimum one of the differences is statistically detected with reference to various kinds of reference curves. In addition, the directions and the curvatures of the picture elements may be determined by deriving the density levels of the picture elements along a plurality of arcuate lines specified by line directions and line curvatures.

One feature of the present invention, as recited in claim 1 and as similarly recited in claim 10, provides where the transmitting means of the reader/writer includes, for each partial image, means for extracting from the input fingerprint a partial image requested by the requesting means of the mobile storage device, means for transmitting the extracted partial image to the mobile storage device, and means for repeatedly extracting and transmitting each of the partial images one by one until a satisfactory level of matching is achieved. Hara does not disclose where

partial images are extracted and transmitted individually, that is, one partial image is extracted and then transmitted at a time, as in the present invention.

Therefore, Hara fails to teach or suggest “wherein the transmitting means of the reader/writer comprises, for each partial image: means for extracting from the input fingerprint a partial image requested by the requesting means of the mobile storage device, means for transmitting the extracted partial image to the mobile storage device, and means for repeatedly extracting and transmitting each of the partial images one by one until a satisfactory level of matching is achieved” as recited in claim 1 and as similarly recited in claim 10.

The above noted deficiencies of Wiebe in view of Hara are not supplied by any of the other references, particularly Iwata. Therefore, combining the teaching of Iwata with Wiebe in view of Hara, still fails teach or suggest the features of the present invention, as now more clearly recited in the claims.

In the Iwata fingerprint collation device, the fingerprint image of the input fingerprint is detected by a fingerprint input means. A pattern direction extraction means extracts the directions of rising line patterns in the respective parts of the input fingerprint image. A specific point extraction means extracts a specific point provided with the overall features of the rising line patterns in the respective parts of the input fingerprint image. Furthermore, a window image for a positioning deciding means decides a window image for positioning including the specific point. Then, by using the window image for the positioning including the specific point, the window

image of the registered fingerprint and the input fingerprint image are positioned by a fingerprint collation means.

One feature of the present invention, as recited in claim 1 and as similarly recited in claim 10, provides where the transmitting means of the reader/writer includes, for each partial image, means for extracting from the input fingerprint a partial image requested by the requesting means of the mobile storage device, means for transmitting the extracted partial image to the mobile storage device, and means for repeatedly extracting and transmitting each of the partial images one by one until a satisfactory level of matching is achieved. Iwata does not disclose where partial images are extracted and transmitted individually, that is, one partial image is extracted and then transmitted at a time, as in the present invention.

Therefore, Iwata fails to teach or suggest “wherein the transmitting means of the reader/writer comprises, for each partial image: means for extracting from the input fingerprint a partial image requested by the requesting means of the mobile storage device, means for transmitting the extracted partial image to the mobile storage device, and means for repeatedly extracting and transmitting each of the partial images one by one until a satisfactory level of matching is achieved” as recited in claim 1 and as similarly recited in claim 10.

Wiebe, Hara and Iwata each suffer from the same deficiencies relative to the features of the present invention, as recited in the claims. Therefore, combining the teachings of Wiebe, Hara and Iwata in the manner suggested by the Examiner does not render obvious the features of the present invention, as now more clearly recited

in claims 1-10. Accordingly, reconsideration and withdrawal of the 35 U.S.C. §103(a) rejection of claims 1-10 as being unpatentable over Wiebe in view of Hara, further in view of Iwata, are respectfully requested.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to the references used in the rejection of claims 1-10.

New claims 11-21

New claims 11-21 were added so as to more clearly describe the features of the present invention. Specifically, the claims were added to more clearly describe that the present invention is directed to a mobile storage device as recited in claims 11 and 17-20 and an authentication system as recited in claims 12-16 and 21.

Claim 11

Claim 11 is dependent on claim 10. Therefore, Applicants submit that claim 11 should be allowed for at least the same reasons discussed previously regarding independent claim 10.

Claim 12

The present invention, as recited in claim 12, provides an authentication system, where the transmitting means of the reader/writer includes, for each partial image, means for extracting from the input fingerprint a partial image requested by the requesting means of the mobile storage device, means for transmitting the extracted partial image to the mobile storage device, and means for repeatedly

extracting and transmitting each of the partial images one by one until a satisfactory level of matching is achieved. The prior art does not disclose this feature.

More specifically, Wiebe, Hara and Iwata each fail to teach or suggest “wherein the transmitting means of the reader/writer comprises, for each partial image: means for extracting from the input fingerprint a partial image requested by the requesting means of the mobile storage device, means for transmitting the extracted partial image to the mobile storage device, and means for repeatedly extracting and transmitting each of the partial images one by one until a satisfactory level of matching is achieved” as recited in claim 12.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to Wiebe, Hara and Iwata.

Claims 13-16 and 21

The present invention, as recited in claim 13 and as similarly recited in claim 21, provides an authentication system, where the processing unit of the reader/writer includes means for repeatedly transmitting a command, extracting one partial image, transmitting the extracted one partial image, and receiving a collation result of the one partial image, for each partial image, until the matching number of the partial images as a result of a collation exceeds a predetermined threshold value. The prior art does not disclose these features.

Specifically, Wiebe, Hara and Iwata each fail to teach or suggest “wherein said processing unit of said reader/writer comprises: means for repeatedly

transmitting said command, extracting said one partial image, transmitting said extracted one partial image, and receiving the collation result of said one partial image, for each partial image, until the matching number of said partial images as a result of said collation exceeds a predetermined threshold value” as recited in claim 13 and as similarly recited in claim 21.

Claims 14-16 are dependent on claim 13. Therefore, Applicants submit that claims 14-16 should be allowed for at least the reasons set forth above regarding independent claim 13.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to Wiebe, Hara and Iwata.

Claims 17-20

The present invention, as recited in claim 17, provides a mobile storage device capable of communicating with a reader/writer for receiving the input of biological information of a user. In the claimed mobile storage device, a processing unit of the reader/writer includes a means for repeatedly transmitting a command, extracting the one partial image, transmitting the extracted one partial image, and receiving the collation result of the one partial image, for each partial image, until the matching number of the partial images as a result of the collation exceeds a predetermined threshold value. The prior art does not disclose these features.

The present invention, as recited in claim 17, also provides a mobile storage device, where the processing unit of the mobile storage device includes means for

repeatedly transmitting information for specifying the one partial image in response to the command from the reader/writer, collating the partial image in response to the one partial image from the reader/writer, and transmitting the collation result, for each partial image. The prior art does not disclose these features.

Particularly, Wiebe, Hara and Iwata each fail to teach or suggest “wherein said processing unit of said reader/writer comprises: means for repeatedly transmitting said command, extracting said one partial image, transmitting said extracted one partial image, and receiving the collation result of said one partial image, for each partial image, until the matching number of said partial images as a result of said collation exceeds a predetermined threshold value” as recited in claim 17.

Furthermore, Wiebe, Hara and Iwata each fail to teach or suggest “wherein said processing unit of said mobile storage device comprises: means for repeatedly transmitting information for specifying said one partial image in response to said command from said reader/writer, collating said partial image in response to said one partial image from said reader/writer, and transmitting said collation result, for each partial image” as recited in claim 17.

Claims 18-20 are dependent on claim 17. Therefore, Applicants submit that claims 18-20 should be allowed for at least the reasons set forth above regarding independent claim 17.


The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to Wiebe, Hara and Iwata.

In view of the foregoing amendments and remarks, Applicants submit that claims 1-21 are in condition for allowance. Accordingly, early allowance of claims 1-21 is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Mattingly, Stanger, Malur & Brundidge, P.C., Deposit Account No. 50-1417 (referencing attorney docket no. 566.40671X00).

Respectfully submitted,

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